

Anatomy and Physiology

UT Austin Regional 2021



Authored by:

(MG) Mahija Ginjupalli, University of Texas at Austin, B.S.A. Neuroscience '22

(SV) Sophia Velasco, University of Florida, B.S. Biochemistry and Psychology '23

Hello, all! Welcome to the **virtual Anatomy and Physiology B/C Exam** offered by the **2021 UT Regional!** Please read the instructions and expectations below:

(1) The rules for this event have been adapted for our virtual tournament and follow the **2020-2021 Regional Rules**.

(2) This exam comprises multiple-choice (MC), multiple select, and fill-in-the-blank questions. Therefore, partial credit is scarce, so make sure to choose wisely!

(3) For fill-in-the-blank questions, the capitalization of the answers (e.g., Answer vs. answer) will **NOT** be considered (i.e., both answers will be accepted). However, incorrect spelling and unnecessary spaces before/after the answers will lead to a wrong answer. Keep this in mind!

(4) For answers involving letters (e.g., A, B, C), do **NOT** include the period. For example, if the answer is A, do **NOT** enter "A." and enter "A" instead.

(5) If you have any questions or concerns regarding this exam, feel free to contact the author through the following emails: **SV** - velasco.scienceolympiad@gmail.com, **MG** - mginjupalli@utexas.edu.

(6) **Disclaimer:** The exam authors do **not** take credit for the images in this exam. Credits are attributed to the rightful owners.

Per Texas Science Olympiad rules, you must have printed notes for this event. If you are communicating with your partner through a voice or video call, please start it before you begin the test itself.

Significant time spent outside of the browser window is grounds for a penalty or disqualification per TSO policies.

Section I: Integumentary System

MC and MS: Select the most appropriate answer for the questions below. Point values will be denoted.

1. (3.00 pts) Select the statement(s) that apply to the epidermis. (MS, 3)

(Mark **ALL** correct answers)

- A) Has no nerve endings
- B) Has sparse nerve endings
- C) It is a nonkeratinized stratified squamous epithelium.
- D) Lacks blood vessels
- E) Has plenty of blood vessels

2. (1.00 pts) Which cell has long branching processes and shed melanin-containing fragments from their tips? (1)

- A) Keratinocytes

- B) Melanocytes
- C) Merkel cells
- D) Tactile cells
- E) None of the above

3. (3.00 pts) Which of the following stratum contains Langerhans cells? (MS, 3)

(Mark ALL correct answers)

- A) Corneum
- B) Basale
- C) Lucidum
- D) Spinosum
- E) Granulosum

4. (1.00 pts) The stratum _____ is densely packed with eleidin. (1)

- A) Corneum
- B) Basale
- C) Lucidum
- D) Spinosum
- E) Granulosum

5. (3.00 pts) Select the statements that apply to carotene. (MS, 3)

(Mark ALL correct answers)

- A) It is a dark red pigment (in the body).
- B) It can become concentrated in the stratum basale.
- C) It is best seen in "corns" or calluses of the feet.
- D) It is a yellow pigment.
- E) It is acquired from egg yolks.

6. (1.00 pts) Which of the following is a term for the blueness of skin resulting from oxygen deficiency? (1)

- A) Bronzing
- B) Jaundice
- C) Erythema
- D) Cyanosis
- E) Albinism

7. (1.00 pts) Melanin is synthesized from what amino acid? (1)

- A) Alanine
- B) Lysine
- C) Glycine
- D) Proline
- E) Tyrosine

8. (1.00 pts) What is the term for birthmarks (patches of discolored skin caused by benign tumors of the skin capillaries)? (1)

- A) Freckles

- B) Nevus
- C) Mole
- D) Hemangiomas
- E) Friction ridge

9. (3.00 pts) Which of the following is true about skin? (MS, 3)

(Mark ALL correct answers)

- A) It is populated by bacteria.
- B) It is populated by fungi.
- C) Vigorous scrubbing in a shower gets rid of bacteria and other microorganisms present.
- D) Sweat forms a basic film on the skin.
- E) Sweat forms an acidic film on the skin.

10. (3.00 pts) Which of the following can enter the skin? (MS, 3)

(Mark ALL correct answers)

- A) Poison ivy alkaloids
- B) Mercury
- C) Arsenic
- D) Lead
- E) Carbon tetrachloride
- F) Nail polish remover

11. (1.00 pts) Which vitamin is essential in regulating blood calcium and phosphate levels? (1)

- A) A
- B) B
- C) D
- D) E
- E) F

12. (1.00 pts) Which of the following are accessory organs of the skin? (1)

- A) Hair
- B) Cutaneous glands
- C) Skin
- D) A and B
- E) All of the above

13. (1.00 pts) Which of the following is made of soft keratin? (1)

- A) Hair
- B) Nails
- C) Stratum corneum
- D) A and B
- E) All of the above

14. (3.00 pts) Select the statement(s) that apply to hair. (MS, 3)

- (Mark ALL correct answers)
- A) Another name is pilus.
 - B) The number of hairs in a given area does not differ much between the sexes.
 - C) Lanugo is longer and coarser than terminal hair.
 - D) It is made of nonkeratinized cells.
 - E) Hair is found everywhere on the body.

15. (1.00 pts) Which of the following is the swelling at the base of hair? (1)

- A) Root
- B) Shaft
- C) Bulb
- D) Papilla

16. (3.00 pts) Why might a cellist who repeatedly uses their fingers to play their instrument develop calluses? (MS, 3)

(Mark ALL correct answers)

- A) Accumulation of dead keratinocytes on fingers
- B) Accelerated keratinocyte multiplication due to mechanical stress
- C) Excessive flaking of keratinocytes off of finger surfaces
- D) Filaggrin released by keratohyalin granules binds keratin filaments in skin into coarse, tough bundles following repeated mechanical stress

17. (3.00 pts) Which skin layer(s) are drugs NOT commonly introduced to by injection? (MS, 3)

(Mark ALL correct answers)

- A) Hypodermis
- B) Papillary layer
- C) Stratum spinosum
- D) Reticular layer

18. (1.00 pts) Which of the following layers is not found in the epidermis of the back? (1)

- A) Stratum lucidum
- B) Stratum corneum
- C) Stratum spinosum
- D) Stratum granulosum

19. (3.00 pts) Which of the following is NOT true about vellus hair? (MS, 3)

(Mark ALL correct answers)

- A) It is the fine, downy, unpigmented hair of a fetus in the last three months of development
- B) It is the fine, pale hair of a baby at the time of birth
- C) It forms the eyebrows and eyelashes and covers the scalp
- D) Constitutes about 2/3 of the hair of women

20. (1.00 pts) People of darker skin have... (1)

- A) A greater number of melanocytes than people of lighter skin
- B) Melanocytes that produce more melanin than people of lighter skin
- C) Greater concentration of melanocytes in the stratum lucidum than people of lighter skin
- D) None of the above

21. (3.00 pts) With age, dermal papillae tend to... (MS, 3)

(Mark **ALL** correct answers)

- A) Flatten
- B) Increase in number
- C) Protrude more
- D) Decrease in number

22. (3.00 pts) Which of the following is not the underlying cause of red hair? (MS, 3)

(Mark **ALL** correct answers)

- A) A lack of eumelanin
- B) Excess pheomelanin
- C) Trichosiderin
- D) Air spaces within hair shaft

23. (1.00 pts) What gives the stratum granulosum its coarse, dark-staining appearance? (1)

- A) Melanin granules
- B) Keratohyalin granules
- C) Eleidin granules
- D) Kraissl's granules

24. (1.00 pts) Sudoriferous glands are defined as... (1)

- A) Oil glands associated with hair follicles
- B) Sweat glands
- C) Scent glands found in regions covered by the pubic, axillary, and male facial hair
- D) Earwax-producing glands

25. (3.00 pts) What does sunscreen NOT protect against? (MS, 3)

(Mark **ALL** correct answers)

- A) Squamous cell carcinoma
- B) Basal cell carcinoma
- C) Melanoma
- D) Ecthyma

Fill-in-the-blank: Provide the most appropriate answer for the following statements below. Each is worth **one** point.

26. (1.00 pts) _____ is composed of clumps of dander stuck together by oil from the scalp.

dandruff

27. (1.00 pts) _____ is a red pigment carried in skin blood vessels.

hemoglobin

28. (1.00 pts)

The _____ is composed mainly of collagen but also has elastic and reticular fibers, fibrous connective tissue, sweat glands, sebaceous glands, hair follicles, and nail roots.

Dermis

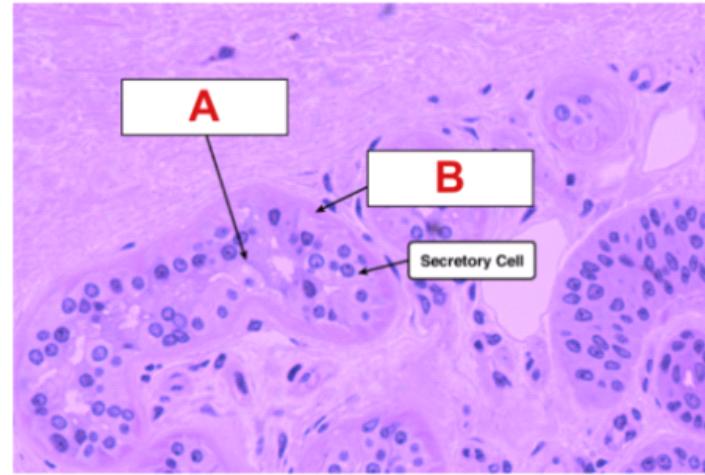
29. (1.00 pts) Mechanical stress from manual labor or tight shoes can result in _____ on the hands or feet. (Answer conditions: Plural form).

calluses

30. (1.00 pts) The stratum _____ is pale and has a featureless appearance since the cells have no nuclei or other organelles.

lucidum

Histology and Pathology: Answer the following questions based on the provided image.



31. (2.00 pts) What skin gland (Box A) is shown in the image? (Answer conditions: Three words; singular form, not plural; spelling counts!). (2)

eccrine sweat gland

32. (1.00 pts) Secretory cells contain light and dark-staining cells. Which secretes glycoprotein? (1)

- A) Light-staining cells
- B) Dark-staining cells
- C) Both
- D) Neither

33. (1.00 pts) Secretory cells contain light and dark-staining cells. Which secretes a watery substance similar in composition to an ultrafiltrate of blood? (1)

- A) Light-staining cells
- B) Dark-staining cells
- C) Both
- D) Neither

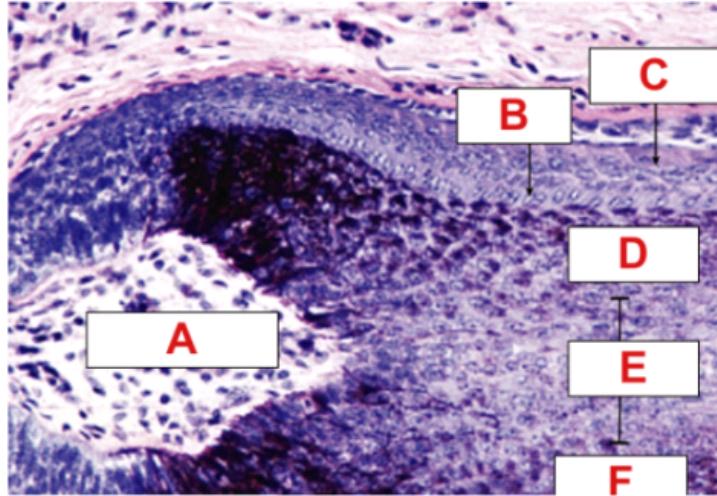
34. (2.00 pts) Box B refers to a _____ cell. (2) (Answer conditions: Do not input the word cell; one word; spelling counts!)

myoepithelial

35. (4.00 pts) What is the function of the cell in the previous question? (4)

Expected Answer: contract to rapidly express sweat on the skin surface

Label. Each is worth two points.



36. (2.00 pts) Box A (Answer conditions: Two words; spelling counts! PLURAL FORM)

dermal papillae

37. (2.00 pts) Box B (Answer conditions: One word; spelling counts!)

cuticle

38. (2.00 pts) Box C (Answer conditions: Two words; spelling counts!)

root sheath

39. (2.00 pts) Box D (Answer conditions: One word; spelling counts!)

cortex

40. (2.00 pts) Box E (Answer conditions: One word; spelling counts!)

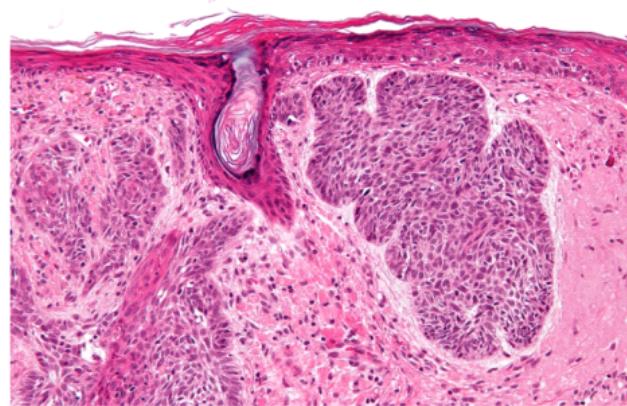
medulla

41. (2.00 pts) Box F (Answer conditions: One word; spelling counts!)

cortex

42. (2.00 pts) This picture is an image of what skin appendage? (Answer conditions: One word; spelling counts!)

Hair



43. (2.00 pts) Identify the disease shown in the image. (Answer conditions: Three words; spelling counts!) (2)

basal cell carcinoma

44. (1.00 pts) True/False: This is the most common type of skin cancer in humans. (1)

- True False

45. (1.00 pts) True/False: This disease typically develops on palms and soles. (1)

- True False

46. (1.00 pts) True/False: This disease is almost always fatal. (1)

- True False

47. (2.00 pts) Exposure to _____ wavelengths is the prime etiological factor in the development of this disease. (2) (Answer conditions: Three letters).

UVB

48. (1.00 pts) Yes or No: Is a skin biopsy necessary for clinical confirmation of this disease? (1)

- A) Yes
 B) No

49. (1.00 pts) True/False: Trunk and limbs are considered low-risk locations. (1)

- True False

50. (1.00 pts) True/False: The nodular version of this cancer has a good prognosis. (1)

Section II: Skeletal System

MC and MS: Select the most appropriate answer for the questions below. Point values will be denoted.

51. (1.00 pts) Which cells synthesize organic matter of the bone matrix and help mineralize the bone? (1)

- A) Osteogenic cells
- B) Osteoblasts
- C) Osteocytes
- D) Osteoclasts

52. (1.00 pts) Which cells are the bone-dissolving cells found on the bone surface? (1)

- A) Osteogenic cells
- B) Osteoblasts
- C) Osteocytes
- D) Osteoclasts

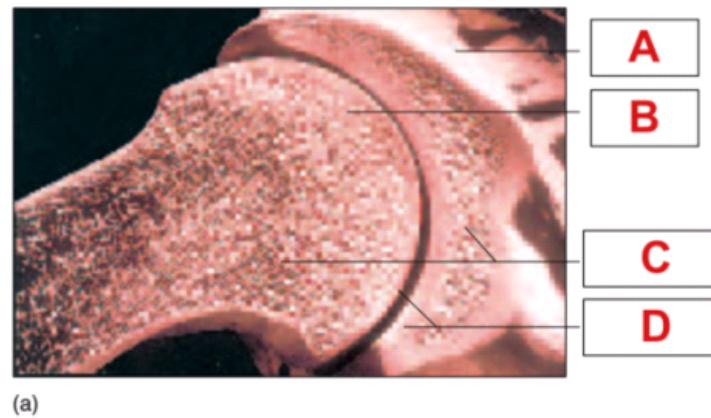
53. (1.00 pts) In a child, the medullary cavity of nearly every bone is filled with: (1)

- A) Red bone marrow
- B) Yellow bone marrow
- C) A and B
- D) Neither

54. (3.00 pts) Select the statement(s) that apply to yellow bone marrow. (MS, 3)

(Mark ALL correct answers)

- A) Can turn into a reddish jelly called gelatinous bone marrow in old age
- B) Produces more blood than red bone marrow
- C) Does not produce blood
- D) Can transform back into red bone marrow
- E) None of the above



(a)

55. (1.00 pts) Which letter points to the humerus? (1)

- A) A
- B) B
- C) None of the above

56. (1.00 pts) Which letter points at compact bone? (1)

- A) C
- B) D
- C) None of the above

57. (1.00 pts) Which letter points at spongy bone? (1)

- A) C
- B) D
- C) None of the above

58. (3.00 pts) Select the statement(s) that apply to appositional growth. (MS, 3)

(Mark ALL correct answers)

- A) Cartilage growth mechanism
- B) Adds more matrix internally
- C) Adds more matrix to the surface
- D) Adds to the length of the bone
- E) Mature bone only grows by appositional growth

59. (3.00 pts) Osseous tissue can sometimes form in: (MS, 3)

(Mark ALL correct answers)

- A) Lungs
- B) Brain
- C) Eyes
- D) Tendons
- E) Arteries

60. (3.00 pts) Which of the following bones of a child's pelvic girdle do NOT fuse to form the adult hip bone? (MS, 3)

(Mark ALL correct answers)

- A) Ilium
- B) Hallux
- C) Pollex
- D) Ischium
- E) Pubis

61. (1.00 pts) When wearing braces, osteoblasts are depositing bone in [BLANK] zones and osteoclasts dissolve bone in [BLANK] areas. (1)

- A) Low-pressure; High-pressure
- B) Low-pressure; Low-pressure
- C) High-pressure; Low-pressure
- D) High pressure; High-pressure

62. (1.00 pts) Which of the following identifying features would tell you that a skeleton was male? (1)

- A) 100-degree subpubic angle
- B) Wide and shallow sacrum
- C) Smoother bones
- D) Heart-shaped pelvic inlet
- E) Larger pelvic outlet

63. (3.00 pts) Nodding yes does NOT mainly involve... (MS, 3)

(Mark ALL correct answers)

- A) Occipital condyles
- B) Parietal condyles
- C) Superior articular facet of Atlas (vertebra C1)
- D) Inferior articular facet of Atlas (vertebra C1)

64. (3.00 pts) Which of the following is NOT true about osteocalcin? (MS, 3)

(Mark ALL correct answers)

- A) It serves as a structural protein of bone
- B) It is secreted by osteocytes
- C) It decreases adipocyte insulin sensitivity
- D) It limits the growth of adipose tissue

65. (3.00 pts) Cervical vertebrae differ from lumbar vertebrae in which of the following ways? (MS, 3)

(Mark ALL correct answers)

- A) Size
- B) Bifid spinous process
- C) Presence of transverse foramina
- D) Presence of transverse processes

66. (1.00 pts) Which of the following structures are NOT produced via endochondral ossification? (1)

- A) Clavicle
- B) Vertebrae
- C) Ribs
- D) Sternum
- E) Scapula

67. (1.00 pts) A newborn child with depressed fontanelles might be diagnosed with... (1)

- A) Dehydration
- B) Hydrocephalus
- C) High intracranial pressure
- D) None of the above

68. (3.00 pts) Individuals with achondroplastic dwarfism have [BLANK] while those with pituitary dwarfism have [BLANK]: (MS, 3)

(Mark ALL correct answers)

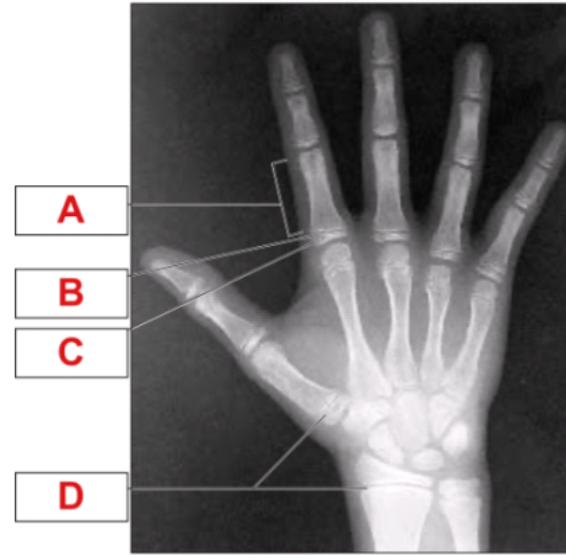
- A) Normal skeletal proportions throughout the body; Normal-sized head and trunk with short limbs

- B) Normal-sized head and trunk with short limbs; Normal skeletal proportions throughout the body
- C) Stunted growth only in long bones of the limbs; Stunted growth in all of the bones
- D) Stunted growth in all of the bones; stunted growth only in the long bones of the limbs

69. (1.00 pts) When assessing individuals for scoliosis, what angle do you look at? (1)

- A) Beltik angle
- B) Townes angle
- C) Cobb angle
- D) Borgov angle

Labeling: Label the provided images. Each is worth **two** points. Spelling counts!



Disclaimer: Answers for this image will be **general** parts of a long bone, not specific names.

70. (2.00 pts) A (Answer conditions: One word. SINGULAR FORM, NOT PLURAL).

diaphysis

71. (2.00 pts) B (Answer conditions: Two words. SINGULAR, NOT PLURAL).

Epiphyseal plate

72. (2.00 pts) C (Answer conditions: One word. SINGULAR, NOT PLURAL).

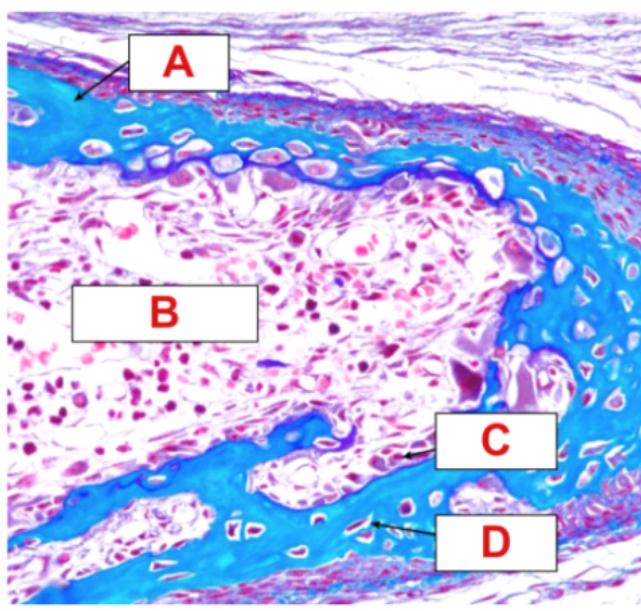
Epiphysis

73. (2.00 pts) D (Answer conditions: Two words; PLURAL form).

Epiphyseal plates

Histology and Pathology: Answer the following questions based on the provided image.

Label. Hint: This is an image of intramembranous ossification.



74. (2.00 pts) Box A (Answer conditions: One word; spelling counts!) (2)

bone

75. (2.00 pts) Box B (Answer conditions: One word; spelling counts!) (2)

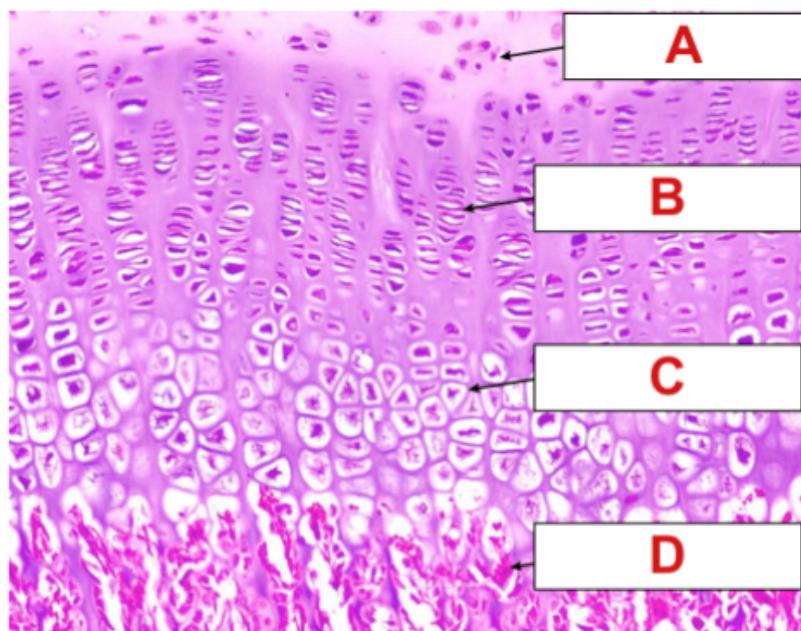
mesenchyme

76. (2.00 pts) Box C (Answer conditions: One word; spelling counts!) (2)

osteoblast

77. (2.00 pts) Box D (Answer conditions: One word; spelling counts!) (2)

osteocyte



78. (2.00 pts) Each lacuna contains numerous chondrocytes in: (2)

- A) A
- B) B
- C) C
- D) D

79. (2.00 pts) Cartilage is not being converted into bone matrix in: (2)

- A) A
- B) B
- C) C
- D) D

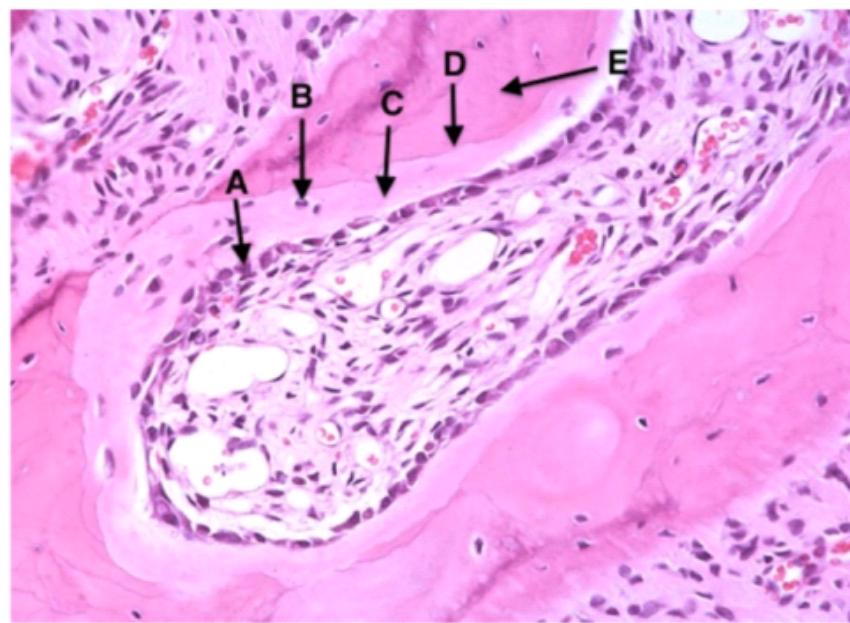
80. (2.00 pts) Calcified cartilage is shown in: (2)

- A) A
- B) B
- C) C
- D) D

81. (2.00 pts) Chondrocytes and their lacunae appear much larger than their resting states in: (2)

- A) A
- B) B
- C) C
- D) D

Label. Hint: New bone is laid down in this image.



82. (2.00 pts) A (Answer conditions: One word; plural form.) (2)

osteoblasts

83. (2.00 pts) B (Answer conditions: One word; plural form.) (2)

osteocytes

84. (2.00 pts) C (Answer conditions: One word; singular form) (2)

osteoid

85. (2.00 pts) D (Answer conditions: Two words; singular form) (2)

cement line

86. (2.00 pts) E (Answer conditions: One word; singular form.) (2)

bone

Bone Identification: Select the most appropriate answer for each question. Each is worth **one** point.

87. (1.00 pts) Identify the depression.



- A) Capitulum
- B) Styloid process
- C) Trochlea
- D) Olecranon fossa

88. (1.00 pts)



- A) Acromion process
- B) Coracoid process
- C) Coronoid process
- D) Spine

89. (1.00 pts)



- A) Metacarpal
- B) Carpal
- C) Phalange
- D) Metatarsal

90. (1.00 pts) Identify the feature indicated by the star.



- A) Supraspinous fossa
- B) Infraspinous fossa
- C) Glenoid fossa
- D) Subscapular fossa

91. (1.00 pts)



- A) Vomer
- B) Maxillary
- C) Nasal
- D) Ethmoid

92. (1.00 pts)



- A) Condylar process
- B) Coronoid process
- C) Occipital condyle
- D) Styloid process

93. (1.00 pts) Identify the structure at the arrow tip.



- A) Spinous process
- B) Xiphoid process
- C) Suprasternal notch
- D) Manubrium

94. (1.00 pts) What type of vertebrae is shown in this image?



- A) Cervical
- B) Thoracic
- C) Lumbar
- D) Sacral

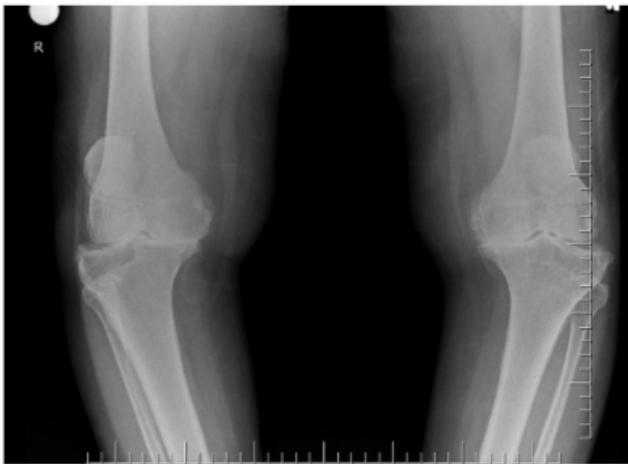
Based on the provided images, identify the disease/condition/injury **as stated in the rules (even if it is plural)**. Each is worth **three** points. Spelling counts!

95. (3.00 pts)



anterior cruciate ligament te

96. (3.00 pts)



osteoarthritis

97. (3.00 pts)



disc herniation

98. (3.00 pts)



scoliosis

99. (3.00 pts)



spinal fractures

100. (3.00 pts)



W 4000 ; L 700

Osteoporosis

Section III: Muscular System and Joints

MC and MS: Select the most appropriate answer for the questions below. Point values will be denoted.

101. (3.00 pts) Which of the following is a function of muscle? (MS, 3)

(Mark ALL correct answers)

- A) Movement
- B) Heat production
- C) Stability
- D) Communication
- E) Control of body openings
- F) Control of passages

102. (1.00 pts) The sparse layer of areolar connective tissue surrounding skeletal muscle cells is called the _____. (1)

- A) Perimysium
- B) Fascicle
- C) Epimysium
- D) Endomysium

103. (1.00 pts) How many ways are there for a muscle to attach to the bone? (1)

- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

104. (1.00 pts) Which fascicle orientation is feather-shaped? (1)

- A) Convergent

- B) Pennate
- C) Circular
- D) Parallel
- E) None of the above

105. (1.00 pts) The _____ is the muscle that produces most of the force during a particular joint action. (1)

- A) Antagonist
- B) Fixator
- C) Prime mover
- D) Synergist

106. (3.00 pts) Select the statement(s) that apply to antagonists. (MS, 3)

(Mark ALL correct answers)

- A) The biceps and triceps are an example of an antagonistic pair of muscles that act on opposite sides of a joint.
- B) It fixes the bone, allowing another muscle attached to it to pull on something else.
- C) Opposes the prime mover.
- D) When you extend your arm to pick up a glass of water, the triceps brachii acts as the antagonist while the biceps brachii act as the prime mover.
- E) Antagonistic pairs at a joint are needed because a muscle can only pull, not push.
- F) Antagonistic pairs at a joint are needed because a muscle can only push, not pull.

107. (1.00 pts) A _____ is a freely movable joint. (1)

- A) Diarthrosis
- B) Amphiarthrosis
- C) Synarthrosis
- D) None of the above

108. (1.00 pts) What is the term for a joint at which two bones are bound by a ligament only? (1)

- A) Serrate suture
- B) Squamous suture
- C) Plane suture
- D) Gomphoses
- E) Syndesmosis

109. (3.00 pts) Select the statement(s) that apply to synostoses. (MS, 3 points)

(Mark ALL correct answers)

- A) It is also called a bony joint.
- B) This joint involves two bones, once separate, fusing via osseous tissue.
- C) Only fibrous joints ossify with age.
- D) Only cartilaginous joints ossify with age.
- E) Both fibrous and cartilaginous joints ossify with age.

110. (1.00 pts) The bones of a synovial joint are separated by a: (1)

- A) Articular capsule
- B) Fibrous capsule

- C) Synovial membrane
- D) Joint cavity
- E) Articular cartilage
- F) Bursa

111. (1.00 pts) How many types of synovial joints are there? (1)

- A) 1
- B) 2
- C) 3
- D) 4
- E) 5
- F) 6

112. (1.00 pts) At a _____ joint, one bone has a convex surface that fits into a concave depression of the other one. (1)

- A) Ball-and-socket
- B) Hinge
- C) Saddle
- D) Pivot

113. (3.00 pts) Which of these muscles is NOT an adductor? (MS, 3)

(Mark ALL correct answers)

- A) Gluteus medius
- B) Tensor fascia lata
- C) Pectineus
- D) Iliacus

114. (1.00 pts)

Myasthenia gravis in patients with ptosis (a droopy upper eyelid) can be tested for in the clinic with the ice cube test, where an ice pack is applied to the affected upper eyelid for 2-5 minutes. A positive test is the improvement of ptosis by > 2mm or more. Why does the ptosis improve? (1)

- A) The cold decreases the acetylcholinesterase break-down of acetylcholine at the neuromuscular junction
- B) The cold increases the acetylcholinesterase break-down of acetylcholine at the neuromuscular junction
- C) The cold decreases the monoamine oxidase break-down of dopamine at the neuromuscular junction
- D) The cold increases the monoamine oxidase break-down of dopamine at the neuromuscular junction

115. (3.00 pts) Which of the following statements relate to each other? (MS, 3)

(Mark ALL correct answers)

- A) White muscles
- B) Fast-contracting
- C) Low amount of sarcoplasmic reticulum
- D) Relatively large supply of myoglobin

116. (3.00 pts) Depression of the scapula occurs mainly by the action of... (MS, 3)

(Mark ALL correct answers)

- A) The trapezius
- B) The serratus anterior

- C) Gravitational pull
- D) None of the above

117. (1.00 pts) The [BLANK] is known as the sphincter of the eyelids. (1)

- A) Orbicularis oculi
- B) Levator palpebrae superioris
- C) Corrugator supercilii
- D) Nasalis

118. (3.00 pts) Of the facial muscles, the [BLANK] is more superficial than the [BLANK] when looking at the front of the head? (MS, 3)

(Mark ALL correct answers)

- A) Frontalis; Nasalis
- B) Nasalis; Frontalis
- C) Orbicularis oculi; Masseter
- D) Masseter; Orbicularis oculi

119. (1.00 pts) Which of the following is the only muscle in the orbital and nasal regions that is innervated by the oculomotor nerve rather than the facial nerve? (1)

- A) Orbicularis oculi
- B) Levator palpebrae superioris
- C) Corrugator supercilii
- D) Nasalis

120. (3.00 pts) Dystrophin either directly or indirectly transfers the force of myofilament movement to the... (MS, 3)

(Mark ALL correct answers)

- A) Basal lamina
- B) Endomysium
- C) Sarcolemma
- D) Linking proteins

121. (1.00 pts) Which of the following choices has the correct order in the structural hierarchy of a skeletal muscle? Order from most complex to least complex. (1)

- A) Muscle fiber > Fascicle > Myofibril > Sarcomere > Myofilament
- B) Fascicle > Myofibril > Muscle fiber > Myofilament > Sarcomere
- C) Muscle fiber > Myofibril > Sarcomere > Myofilament > Fascicle
- D) Fascicle > Muscle fiber > Myofibril > Sarcomere > Myofilament

122. (1.00 pts) Smooth muscle cells have [BLANK] while skeletal muscles do not. (1)

- A) Sarcoplasmic reticulum
- B) Tropomyosin
- C) Calmodulin
- D) Z discs
- E) Myosin ATPase

Fill-in-the-blank: Provide the most appropriate answer for the following statements below. Each is worth **one** point.

123. (1.00 pts) _____ muscles are thick in the middle and tapered at each end. An example is the biceps brachii.

Fusiform

124. (1.00 pts) Some muscles are connected to a broad sheetlike tendon called an _____.

aponeurosis

125. (1.00 pts) An _____ muscle is entirely contained within a particular region, having both its origin and insertion there.

Intrinsic

126. (1.00 pts) Another name for the prime mover is _____.

Agonist

127. (1.00 pts) _____ is an intermediate filament that forms a lattice surrounding the sarcomere near the Z lines.

Desmin

128. (1.00 pts) _____ is believed to link actin filaments to the external lamina of the muscle cell.

Dystrophin

129. (1.00 pts) _____ anchors thick filaments to the M line.

Myomesin

130. (1.00 pts) _____ anchors thick filaments to Z lines, preventing excessive stretching.

Titin

131. (1.00 pts) _____ attaches to the free end of an actin filament to maintain its length.

tropomodulin

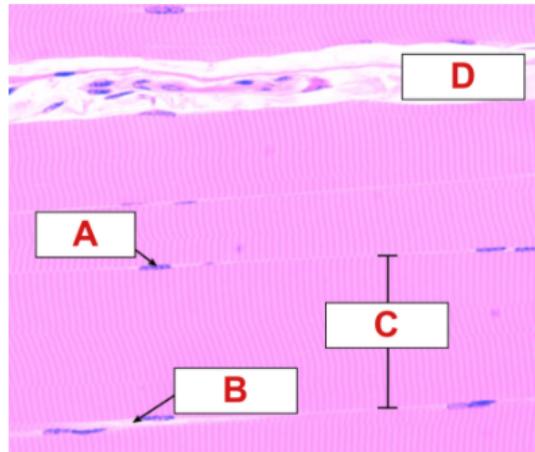
132. (1.00 pts) The _____ is the cell plasma membrane of a muscle cell.

Sarcolemma

133. (1.00 pts)

The _____ band is in the middle of a sarcomere and corresponds to the myosin filaments together with the thin filaments overlapping on both ends. (Answer conditions: Only state the letter.)

A



134. (2.00 pts) Box A. (Answer conditions: One word; spelling counts!) (2)

Nucleus

135. (2.00 pts) Box B (Answer conditions: One word; spelling counts!) (2)

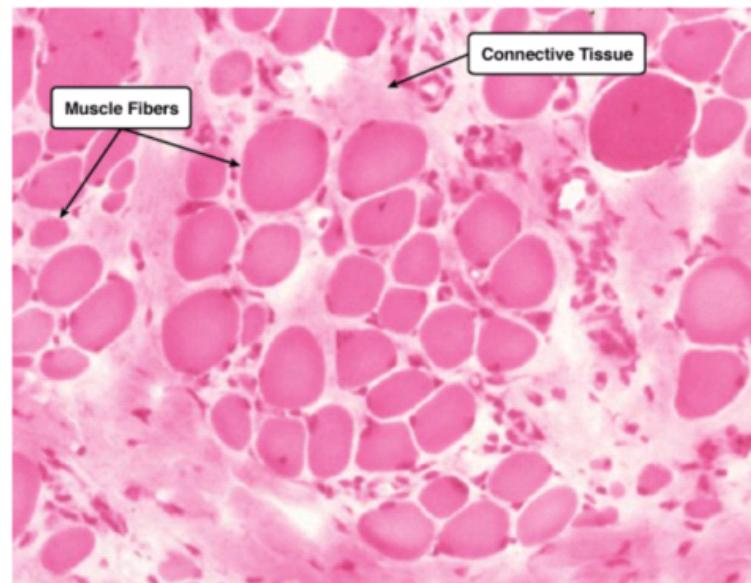
Endomysium

136. (2.00 pts) Box C (Answer conditions: Two words; spelling counts!) (2)

muscle cell

137. (2.00 pts) Box D (Answer conditions: One word; spelling counts!) (2)

Perimysium



138. (2.00 pts) State the acronym for this disease. (2)

139. (1.00 pts) True/False: This disease has a genetic basis. (1)

- True False

140. (2.00 pts) This disease is caused by the absence of what protein? (2) (Answer conditions: One word; spelling counts!)

dystrophin

141. (1.00 pts) True/False: Death commonly occurs in the twenties. (1)

- True False

142. (3.00 pts) The _____ hypothesis explains why some female carriers show symptoms of this disease. (Answer conditions: One word; Spelling counts.) (3)

Lyon

143. (1.00 pts) Who is more frequently affected: girls or boys? (1)

- A) girls
 B) boys

144. (4.00 pts) A waddling gait is common when individuals are afflicted with this disease. What is another term for this gait? (4) (Answer conditions: One word; spelling counts!)

Trendelenburg

145. (1.00 pts) Is the prognosis for this disease good or poor? (1)

- A) good
 B) poor

146. (1.00 pts) Is there a medical cure for this disease? Yes or No? (1)

- A) yes
 B) no

147. (1.00 pts) True/False: Glucocorticoid therapy is a management option for this disease. (1)

- True False

We hope you enjoyed this exam! If you have any feedback about any of the exams at this tournament, please let us know through this form: <https://tinyurl.com/utreg21feedback> (<https://tinyurl.com/utreg21feedback>)